TITLE

TOOTHBRUSH ASSEMBLY WITH TOOTHPASTE DISPENSER

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of the co-pending U.S. patent application serial no. 10/420,384 filed April 22, 2003, which application claims the benefit of U.S. provisional patent application serial no. 60/374,422 filed April 22, 2002.

BACKGROUND OF THE INVENTION

The present invention relates generally to a toothbrush apparatus and, in particular, to a toothpaste dispenser and toothbrush combination.

Toothbrushes and toothpaste dispensers are well known. Occasionally, the multiple steps of placing toothpaste from the toothpaste dispenser onto the brushes of the toothbrush become time-consuming and tedious. At other times, either the toothbrush, the toothpaste dispenser, or both, can not be located, causing frustration.

It is desirable, therefore, to provide a toothbrush having a toothpaste dispenser integral with the toothbrush body in order to overcome the disadvantages noted above. It is also desirable to provide a low cost toothbrush having a toothpaste dispenser that is reusable and/or includes replaceable components.

SUMMARY OF THE INVENTION

A toothbrush assembly in accordance with the present invention includes a canister releasably housing a cartridge for storing dentifrice (toothpaste) that is selectively provided to a brush head attached to a stem that is connected to the canister. A passage extends through the stem and connects an aperture in the brush head with a supply tube in an interior of the cartridge. A piston fits into an open upper end of the cartridge and is spring biased to force the dentifrice through the supply tube and the passage in the stem. A normally closed valve is disposed in the passage for controlling a flow of the dentifrice from the cartridge to the aperture in the brush head.

The toothbrush assembly in accordance with the present invention advantageously provides a toothbrush having a toothpaste dispenser integral with the toothbrush body. The toothbrush assembly in accordance with the present invention also

provides a low cost toothbrush having a toothpaste dispenser that is reusable or replaceable.

DESCRIPTION OF THE DRAWINGS

The above, as well as other advantages of the present invention, will become readily apparent to those skilled in the art from the following detailed description of a preferred embodiment when considered in the light of the accompanying drawings in which:

Fig. 1 is an exploded perspective view of a toothbrush assembly in accordance with the present invention;

Fig. 2 is a partial cross sectional view of the toothbrush assembly in Fig. 1 shown in an assembled configuration;

Fig. 3 is a fragmentary cross sectional view of an alternative embodiment of a brush head stem and brush head in accordance with the present invention;

Fig. 4 is a perspective view of an alternative embodiment of a toothbrush assembly in accordance with the present invention; and

Fig. 5 Fig. 2 is a partial cross sectional view of an alternate embodiment toothbrush assembly according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to Figs. 1 and 2, a toothbrush assembly according to the present invention is indicated generally at **10**. The toothbrush assembly **10** includes a canister **11** for grasping by a human hand. An open upper end of the canister **11** is adapted to receive a dentifrice cartridge **12**. Preferably, the cartridge **12** is substantially hollow with open upper and lower ends defining a dentifrice storage area therein. The open upper end of the cartridge **12** is releasably connected to a lower end of a brush head stem member **19**. Preferably, the lower end of the brush head stem **19** is secured to the upper end of the cartridge **12** by a threaded connection or any suitable releasable attachment means. An upper end of the brush head stem **19** includes a brush head **13** attached thereto.

When the pre-filled cartridge **12** is inserted into the open upper end of the canister **11**, the open lower end of the cartridge **12** receives a piston **14** that is slidably disposed in

the interior of the canister **11**. The piston **14** is biased by a compression spring **15** that is attached to a lower end of the piston **14** and engages at the interior of the lower end of the canister **11**. The cartridge **12** is locked in place with the canister **11** by engaging a fitting **16** of the bayonet-type or similar fitting at the respective engaging bases of the canister **11** and the cartridge **12**. In an alternative embodiment (not shown), the fitting **16** is in the form of a pair of downwardly extending tabs on the lower end of the cartridge **12** that cooperate with apertures formed near the lower end of the canister **11**. The tabs clip into and can be released from the apertures through the application of finger pressure. Those skilled in the art, however, will appreciate that various means of releasably joining the cartridge **12** and the canister **11** may be utilized while remaining within the scope of the present invention.

When the cartridge **12** is filled with dentifrice and the upper end of the cartridge is blocked, as explained below, the piston **14** will be pushed downwardly compressing the spring **15** when the cartridge **12** is inserted in the canister **11**. The spring **15** applies a force to the piston **14** which pressurizes the dentifrice in the cartridge **12**. When the dentifrice in the cartridge **12** is exhausted, the cartridge **12** can be removed from the canister **11** by releasing the fitting **16** from the locked position. The removed cartridge **12** can be refilled and reinserted or another already filled cartridge **12** can be inserted.

A passage **18** is formed in the interior of the brush head stem **19** and at one end is exposed to the interior of the cartridge **12**. At an opposite end of the passage **18** there is at least one aperture **20** in the brush head **13**. Flow of the pressurized dentifrice is controlled by a valve, indicated schematically at **30**, that is operable to be actuated by a button **21** located near the top of the cartridge **12**. Alternatively, the button **21** is located at the base of the brush head stem **19** (not shown) or any other suitable location on the canister **11**, the cartridge **12**, or the brush head stem **19**. When actuated, the valve **30** opens and allows the pressurized dentifrice to flow through the passage **18** from the cartridge **12** to the apertures **20**. Preferably, the valve **30** and the button **21** include a means for returning the valve **30** to the closed position after the button **21** has been released. Preferably, a check valve, indicated schematically at **27**, is installed in the passage **18** adjacent each of the apertures **20** to allow flow of the dentifrice out of the apertures **20** while preventing flow of the dentifrice or water into the apertures **20**.

Alternatively, a functional dental floss unit **22** is attached to the base or lower end of the canister **11**. Preferably, the dental floss unit **22** is attached to the canister **11** by a threaded connection or similar connection. As shown in Figs. 1 and 2, the dental floss unit **22** includes a flanged spool **22a** around which a string of dental floss **22b** is wound. The spool **22a** is rotatably mounted on a shaft **22c** having a head **22d** that threadably engages an aperture **11a** formed in the end of the canister **11**. Thus, the dental floss unit **22** can be removed from the canister **11** by unscrewing when the floss **22b** is exhausted and either a replacement unit **22** can be installed or a new spool **22a** with a supply of floss can be installed on the shaft **22c**. As shown in Figs. 1 and 2, the floss **22b** can be dispensed through an opening in the head **22d**.

Referring now to Figs. 3 and 4, an alternative embodiment of a toothbrush assembly according to the present invention is indicated generally at **10'**. In the toothbrush assembly **10'**, a button **21'** is located at the base of a stem **19'**. The button **21'** is operable to slidably actuate a valve **30'** and includes a bolt piston **23** that is biased to a closed position by a spring **24**. By placing pressure on the button **21'** to slide the button **21'** away from a brush head **13'**, the bolt piston **23** is moved to open the valve **30'** allowing the pressurized dentifrice to be forced through a passage **18'** and out of an aperture **20'**. When pressure on the button **21'** is released, the spring **24** returns the button **21'**, the bolt piston **23**, and the valve **30'** to the closed position, preventing any further flow through the passage **18'**. Those skilled in the art, however, will realize that other types of valves or valve actuators can be utilized while remaining within the scope of the present invention.

A cord or lanyard **26**, best seen in Fig. 4, can be attached to the bottom end of the canister **11** or to the dental floss unit **22**. As shown in Fig. 3, a rear or dorsal surface of the brush head **13'** can be provided with a plurality of upstanding flexible ribs **29** to be used as a tongue scraper.

As shown in Figs. 2 and 4, a longitudinally extending window **25** can be provided in a wall of the canister **11** with the adjacent wall of the cartridge **12** being transparent or translucent or having a window for viewing the position of the piston **14** and to observe the quantity of the dentifrice remaining in the cartridge **12**. Alternatively, the canister **11** can be made of a transparent material including, but not limited to, a clear plastic material or the like.

Referring now to Fig. 5, there is shown an alternate embodiment toothbrush assembly **40** according to the present invention. The toothbrush assembly **40** includes a canister **41** for grasping by a human hand. An open lower end **41a** of the canister **41** is adapted to receive a dentifrice cartridge **42**. Preferably, the cartridge **42** is substantially hollow with a closed lower end **42a** and an open upper end **42b** defining a dentifrice storage area **43** therein for receiving a quantity of dentifrice **44**. An upper end **41b** of the canister **41** is releasably connected to a lower end of the brush head stem member **19** that is shown in Figs. 1 and 2. Preferably, the lower end of the brush head stem **19** is secured to the upper end **41b** of the canister **41** by a threaded connection or any suitable releasable attachment means. The upper end of the brush head stem **19** includes the brush head **13** attached thereto.

A perforated wall **46** is positioned in the storage area **43** adjacent the lower end **42a** of the cartridge **42**. The wall **45** has a plurality of apertures **46** formed therein and is attached between an inner surface of the cartridge **42** and a lower end **47a** of a supply tube **47**. Thus, the dentifrice **44** in the storage area **43** above the wall **45** can flow through the apertures **46** and into the open lower end **47a** of the supply tube **47** as indicated by an arrow **48**. An open upper end **47b** of the supply tube **47** mates with an open lower end **18a** of the passage **18** extending through the brush head stem **19** and continuing through the upper end **41b** of the canister **41**. A disk-shaped piston **49** is slidably mounted in the storage area **43** to contain the dentifrice **44**. The cartridge **42** can be disposable (one use) or reusable. If the cartridge **42** is to be refilled with the dentifrice **44**, the piston **49** can be removed from the storage area **43** at the open upper end **42b** and replaced after the dentifrice has been loaded. The supply tube **47** extends through a central aperture in the piston **49** and a periphery of the piston slidably engages the interior surface of the cartridge **42**.

An actuator **50**, preferably a helical compression spring, is positioned in the upper end **42b** of the cartridge **42** to act between an upper surface of the piston **49** and a facing surface of the hollow interior at the upper end **41b** of the canister **41**. The actuator **50** forces the piston **49** in a direction of an arrow **51** toward the wall **45** thereby causing the dentifrice **44** to flow in the direction of the arrow **48** when the valve **30** is actuated to supply the dentifrice to the brush **13** through the passage **18**.

The cartridge **42** is releasably locked in the canister **41** by engaging a fitting **52** of the bayonet-type or similar having pins on the cartridge engaging slots formed in the wall of the canister **41**. Also, the head of the stem **19** can be provided with the ribs **29** shown in Fig. 3, and the cartridge **42** can be provided with the dental floss unit **22** shown in Fig. 1 and/or the lanyard **26** shown in Fig. 4.

In accordance with the provisions of the patent statutes, the present invention has been described in what is considered to represent its preferred embodiment. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope.